

very able investigations, but also for the stimulus which he imparted to research in some of the branches of this comprehensive science. Secondly, my object has been to reply to some criticisms offered in regard to points in the system of classification adopted in arranging his ethnographical collection. And, since such criticisms as have reached me have appeared to me to be founded mainly upon misinterpretation of this system, I have thought that I could meet them best by some sort of restatement of the principles involved.

It would be unreasonable to expect that his work should hold good in all details. The early illustrations of his theories were to be regarded as tentative rather than dogmatic, and in later life he recognised that many modifications in matters of detail were rendered necessary by new facts which had since come to light. The crystallisation of solid facts out of a matrix which is necessarily partially volatile is a process requiring time. These minor errors and the fact of our not agreeing with all his details in no way invalidate the general principles which he urged, and we need but cast a cursory glance over recent ethnological literature to see how widely accepted these general principles are, and how they have formed the basis of, and furnished the inspiration for, a vast mass of research by ethnologists of all nations.

It appears more than probable that Cambridge will be much involved in the future advancement of anthropological studies in Great Britain, if we may judge from the evident signs of a growing interest in the science, not the least of which is the recent establishment of a Board of Anthropological Studies, an important development upon which we may well congratulate the University. Within my own experience there have been many proofs of the existence in Cambridge of a keen sympathy with the principles of ethnological inquiry developed by Colonel Lane Fox, and I feel that, as regards my choice of a theme for the main topic of my address, no apology is needed. For my handling of this theme, on the other hand, I fear it must be otherwise. I would gladly have done fuller justice to the work of Colonel Lane Fox, but, while I claim to be among the keenest of his disciples, I must confess to being but an indifferent apostle.

I have been obliged, moreover, to pass over many interesting features in the work of this ingenious and versatile man of science. I have made no attempt to touch upon his archaeological researches, since it has been necessary for me to restrict myself to a portion only of his scientific work. In this field, as in his ethnological work, his keen insight, ingenuity, and versatility were manifested, while the close attention which he bestowed upon matters of minute detail has rendered classical his work as a field archaeologist. While the greater part of his ethnological work is associated with the name Lane Fox, by which he was known until 1880, most of his researches into the remains of prehistoric times were conducted after he had in that year assumed the name of Pitt Rivers, on inheriting an important estate which, by the happiest of coincidences, included within its boundaries a considerable number of prehistoric sites of the highest importance. That he made full use of his opportunities is amply manifested in his published works. In his archaeological work are repeated the characteristics of his ethnological researches, and one may with confidence say of his contributions to both fields of inquiry that, if he advanced science greatly through his results he furthered its progress even more through his methods. By his actual achievements as a researcher he pushed forward the base of operations; by his carefully-thought-out systems for directing research he developed a sound strategical policy upon which to base further organised attacks upon the Unknown.

#### NOTES.

THE Hugh Miller Memorial Institute at Cromarty was opened on Friday last by Mr. Andrew Carnegie. The institute, which had its inception at the Hugh Miller centenary celebrations two years ago, is a short distance from the house where the geologist was born, and the accommodation provided includes a public library. The site was given by Colonel Ross, of Cromarty; the cost of the build-

ing, amounting to 1200*l.*, was defrayed by Mr. Carnegie, and the public subscribed 400*l.* for an endowment fund.

THE director of the Paris Museum of Natural History has been authorised to accept a gift made by M. Durand of a collection of herbaria and a botanical library, a sum of 5000 francs to pay the expense of transporting and installing these collections, and a further sum of 50,000 francs to be invested with a view to provide a fund for the upkeep of the herbaria and the purchase of plants and of works on botany.

THE International Congress of Physiologists was opened at the Solvay Institute in Brussels on Tuesday.

THE fourth congress of the International Aëronauts Committee, convened by the Imperial Academy of Sciences, was opened at St. Petersburg on Monday.

IT is reported that Mr. Henry Phipps has given 4000*l.* to the Johns Hopkins University, for the study of tuberculosis.

IT is announced that the late Mr. John Innes bequeathed the sum of 300,000*l.* for the erection of a museum at Merton, Surrey.

THE committee appointed by the Texas Legislature to investigate methods for the extermination of the boll weevil and pay a reward of 10,000*l.* to the discoverer of any such method, has decided, says *Science*, that no one has earned this reward.

THE Lancashire and Western Sea Fisheries Joint Committee has appointed Dr. J. T. Jenkins, professor of biology in Hartley University College, Southampton, to be superintendent of sea fisheries in place of the late Captain Dawson.

MR. W. I. LAST, senior keeper in the science division of the Victoria and Albert Museum, has been appointed director of that division of the museum in succession to Major-General Festing, C.B., F.R.S., who has recently retired at the age of sixty-four on the operation of the age limit. Mr. Last was senior Whitworth scholar in 1877, and a Watt medallist of the Institution of Civil Engineers in 1887, and has been for the last few years senior keeper in the science division of the museum, with the special charge of the engineering collections.

THE second International Congress on the History of Religions was opened at Basel on Tuesday. Prof. von Orelli, president of the organising committee, read an address, in the course of which he pointed out that the objects of the conference were purely scientific, and that a propaganda in favour of a particular sect and controversies on the lines of religious discussions during the Middle Ages would not be allowed.

WITH the view to obtain further information on the growth and migrations of salmon (including sea-trout, salmon-trout, peal, sewin, &c.), the Board of Agriculture and Fisheries had had a number of such fish "marked" by attaching a small oblong silver label (oxidised, or blackened, and bearing distinctive letters and numbers) to the dorsal or large back fin. Small rewards will be paid for the recovery of fish bearing such labels or other "marks," or for information respecting them. The Board has prepared lists of persons in the south and west of England, in Wales and Monmouthshire, and in the north of England, who will receive marked fish. The experiments will be continued during a series of years, and the cooperation of net-fishermen, anglers, fishmongers, and all interested in the improvement of the salmon fisheries, is invited in order that the fullest possible results may be secured.

THE value and possibilities of wireless telegraphy as a journalistic adjunct are described in Saturday's *Times* by the special correspondent who established a wireless telegraph system at the theatre of war operations in the Far East with such success that both the belligerents regarded the enterprise as dangerous to their interests. The Japanese Government placed such limitations upon the free movements of the *Haimun*—the vessel chartered by the *Times* for its wireless telegraph service—that this means of communication was discontinued of necessity; and there seems little doubt that in future the use of all systems of wireless communication will be controlled by international law. The De Forest system, with its telephonic receiver, was adopted by the *Times* correspondent as most suitable for war messages, as it will allow the operators to record twenty to thirty words a minute, and its usefulness is not impaired by the working of other systems in the vicinity. The land station was at Wei-hai-wei, where a mast 170 feet high was erected. Even with a mast 90 feet high and 102 feet exposure of wire on board the moving ship, there was not the slightest difficulty in keeping up intercommunication at a distance of 100 sea miles. With the 170 feet mast on land, perfect communication was established over a distance of 180 sea miles, and on one occasion over 210 miles. A long message sent from a point 155 miles from the land station had to cross 30 miles of the mountainous corner of the Shan-tung promontory, the hills of which vary from 200 feet to 1860 feet in height, yet the message reached its destination. As soon as the apparatus was in working order, both Russian and Japanese messages were received by the operator, who could easily recognise the difference in the systems employed, and by this means it was possible approximately to tell the distance of the *Haimun* from the various ships. Moreover, the operator began to recognise the notes of various ships, that is to say, he could tell if a Russian ship was at sea by listening for the answering communication from the shore. He could also detect whether the Japanese messages were being transmitted by relay to the naval base or whether the fleet itself was at sea. The information thus obtained guided the movements of the correspondent, and thus assisted the enterprise, which has had to be abandoned on account of the restrictions placed upon it.

IN NATURE of June 2, Dr. H. A. Wilson pointed out (p. 101) that Prof. Rutherford's value for the absorption coefficient of  $\alpha$  rays is nearly 2000 times greater than Lenard's value for the absorption coefficient of  $\beta$  rays of the same speed. He suggested, as an explanation, that the  $\alpha$  rays consist of positive electrons having a radius 2000 times smaller than negative electrons. Prof. W. H. Bragg, of the University of Adelaide, in a letter which the limitations of space prevent us from publishing, gives reasons for believing that the  $\alpha$  rays penetrate further than  $\beta$  rays of the same speed because they do not suffer from deflection by collision, whereas  $\beta$  radiation of this speed is very much affected thereby.

THE results of an attempt to derive formulæ by which the effect of wind and atmospheric pressure on the tides could be calculated were given by Mr. F. L. Ortt in NATURE several years ago (1897, vol. lvi. pp. 80–84). Dr. Wegemann informs us that these formulæ are printed in the *Getijtafels* for 1904, though they are only true for the deep water at the Hook of Holland and Ymuiden. Theoretical considerations have shown that the tables are not applicable to shallow water (Wegemann, *Annalen der Hydrogr.*, 1904, v.). Dr. Wegemann suggests that in deriving a general formula it would be desirable to name the directions of the wind, not

according to the compass, but to the angle at which they touch the coast. The places should also be grouped according to depth, coast-line, and formation of the sea floor.

DURING each of the months April to June last, the usual scientific balloon ascents have taken place in the countries which generally participate in these useful experiments. Some of the flights have attained great altitudes, e.g. three registering balloons sent up by Baron v. Bassus, from Munich, averaged more than 19,000 metres. Two ascents, from Pavlovsk and from Itteville (near Paris), attained 17,600 metres or more, and one from Trappes reached 16,540 metres. Kite ascents were also made each month by Mr. Rotch at Blue Hill (U.S.), and in May and June by Mr. Dines at Oxshott (Surrey). The value of these researches is recognised by the Royal Academy of Sciences of Amsterdam, which has awarded the Buys-Ballot medal for 1903 to Messrs. R. Assmann, director of the Aëronautical Observatory at Tegel (near Berlin), and A. Berson, of the same institution, for "the great services they have rendered to the development of meteorology" by means of daily observations of the upper air, and as editors of, and contributors to, an elaborate work on scientific balloon ascents.

FROM a report which we have received, it is seen that the present Meteorological Service in Japan is highly organised and more centralised than in this country. It is placed under the direction of the Central Observatory at Tokio, and under the supervision of the Minister of Education, who determines the sites of the provincial stations; any persons who desire to erect meteorological stations (except for rainfall only) must obtain the necessary sanction from the Minister. All provincial stations of the first and second orders have to forward monthly and annual registers to the Central Observatory, while stations of the third order (of which there are more than 1200) send their observations to the "provincial" stations to which they belong. The method of taking observations and the reductions are made in accordance with the regulations of the International Meteorological Committee, and each station is inspected once in three or four years. The principal publications are the daily weather map, monthly and annual reports, and a monthly weather review. The text of the daily weather map is given in English and Japanese. Storm warning telegrams are issued to some 360 stations, and signals are hoisted by day and night. The average success of weather forecasts is 82 per cent., and that of storm warnings 70 per cent. Maritime meteorology has been carried on since 1888; all ships with a tonnage exceeding 100 tons forward logs to the Central Observatory. Much attention is given to earthquake phenomena and to magnetic observations, and since 1880 several expeditions have been made from time to time to high mountains in various portions of the Empire to investigate the processes of the higher strata of the atmosphere. The present director of the service is K. Nakamura.

THE first part of a new serial, *Memoirs of Natural Sciences of the Brooklyn Museum*, is devoted to an account of the medusas of the Bahamas, by Mr. A. G. Mayer. Numerous new forms are described, and the author directs special attention to the difference between the medusa-fauna of the Bahamas and that of the Tortugas—a difference correlated with physical differences in the two areas.

WE have received the July issues of the *Emu* and the *Victorian Naturalist*, the contents of both of which are chiefly devoted to matters of local interest, although a new kestrel from Western Australia is described in the former.

ORNITHOLOGICAL subjects constitute the contents of the August number of the *Zoologist*, so far at least as the separate articles are concerned, the measurements and weights of the eggs of the commoner members of the plover tribe being recorded in the first article by the Messrs. Buchanan. A photograph of the new Orkney vole, in juxtaposition with one of the common vole, forms the frontispiece to the number.

A BICAUDATE specimen of the king-crab is described by Mr. F. F. Smith in No. 8 of *Tuft's College Studies*, while Mr. G. Winslow records three cases of structural abnormalities in tailed amphibians. The origin of the hypophysis cerebri in the salamander, *Amblystoma*, especially in connection with the dispute as to whether it is an endodermal or ectodermal structure, is discussed at considerable length by Messrs. Kingsley and Thyng, and the histology of the digestive tract of the same creature receives attention at the hands of Mr. G. A. Bates. In a list of the mammals in the Barnum Museum of Tuft's College, by Mr. A. E. Preble, it is somewhat curious to find the African elephant "Jumbo" figuring as *Elephas indicus*; it is sincerely to be hoped that this is an error, and not the result of a discovery that *E. indicus* is the proper title of the African elephant.

In the *American Journal of Science* for August, Dr. C. R. Eastman discusses the nature of the limb-like appendages in the fish-like creatures collectively known as Osteostraci, as exemplified in the family Asterolepididae. Five theories have been propounded to explain the nature of these structures. They have been likened, firstly, to arthropod limbs; secondly, they have been regarded as produced and jointed extensions of the head-angles of forms like Cephalaspis; thirdly, they have been derived from a fixed body-spine like that of Acanthaspis; fourthly, they have been considered to be the degenerate development from the lobate fins of the fringe-finned (crossopterygian) ganoids; while, fifthly, they may be *sui generis*. The first two hypotheses Dr. Eastman dismisses as being founded upon misconceptions. The third he regards as presupposing impossible or anomalous conditions. Against the fourth, which was suggested by Mr. C. T. Regan in his paper on the phylogeny of the Teleostomi, recently noticed in our columns, the author advances a number of objections, while he pins his faith on the fifth. Dr. Eastman also takes occasion to record his dissent from Mr. Regan's views as to the existence of a close affinity between the Osteostraci (Cephalaspis, Asterolepis, &c.) and the Arthrodira (Cocco-steus); and also as to the alleged relationship between the latter and the fringe-finned ganoids.

In the same issue Mr. E. H. Sellards publishes an important contribution to our knowledge of Palæozoic cockroaches. Hitherto these insects have been chiefly known by the wings. It is now demonstrated that in bodily organisation they conform essentially to the modern Orthoptera, this agreement also extending to their development, as exemplified by the resemblance of the young to the adult, and by the growth taking place by means of a succession of moults, during which the wings are gradually evolved.

THE fourth volume of the new series of the *Proceedings* of the Aristotelian Society, containing the papers read before the society during the twenty-fifth session, 1903-4, has been published by Messrs. Williams and Norgate. Dr. Shadworth Hodgson contributes two papers dealing respectively with method in philosophy and with reality. Prof. G. F. Stout deals with primary and secondary qualities, and Dr. E. Westermarck has a paper entitled "Remarks on the Subjects of Moral Judgments." Miss E. E. C. Jones re-

capitulates the main points of Prof. Sidgwick's ethical view, and attempts to answer some of the objections to it that have been brought forward in recent criticisms.

IN vol. xxiv., part iv., of *Notes* from the Leyden Museum, Madame C. M. L. Popta describes as new a number of species of cat-fishes (Siluroids) collected by Dr. Nieuwenhaus in Central Borneo in 1898 and 1900. In the same issue Dr. Jentink records the plantain-bat (*Cerivoula picta*) from Sumatra.

MESSRS. PATTEN AND HART have found that the soluble phosphorus of wheat-bran is organic in nature, existing as the magnesium-calcium-potassium salt of a phospho-organic acid having the formula  $C_2H_3P_2O_8$ , and probably identical with Posternak's anhydro-oxymethylene diphosphoric acid (*Bull.* No. 250, New York Agricult. Exper. Station). This acid and its salts seem to be of wide distribution in the vegetable kingdom, having already been isolated from peas, beans, pumpkin and lupine seeds, and from the potato and other tubers and bulbs.

IN the July number of the *Gazzetta Chimica Italiana*, a convenient and practical method for the preparation of nitrosyl chloride is described by Francesconi and Bresciani. It is found that carefully prepared animal charcoal exerts a very considerable catalytic influence on the combination of nitric oxide and chlorine, the temperature most favourable for the reaction being 40° to 50° C. Below 35° and above 70° C. the influence of the catalyser is much less marked.

SEVERAL observations are to be found in the literature which indicate that hydrobromic acid at 1000° C. and hydrochloric acid at 2000° C. are perceptibly dissociated into the elements. The direct quantitative measurement of the extent of dissociation at these high temperatures has not yet been found possible. In the *Zeitschrift für physikalische Chemie* (vol. xlix. p. 70), Messrs. Bodenstein and Geiger have, however, calculated the percentage dissociation from known experimental data, the numbers obtained being:—

	1000° abs.	2000° abs.
Hydrobromic acid ...	0.18 per cent.	6.0 per cent.
Hydrochloric acid ...	0.002 „	0.8 „

IN the current number (vol. xlix. p. 162) of the *Zeitschrift für physikalische Chemie*, Dr. P. P. Fedotieff gives an account of an investigation of the ammonia-soda process from the standpoint of the phase rule. According to the experimental data, it is theoretically possible to convert 80 per cent. of the sodium chloride used into bicarbonate, and in practice the yield under favourable conditions should not fall below 70 per cent. It is interesting to note that, from a purely chemical standpoint, the Solvay process, in which ammoniacal brine is treated with carbonic acid, is not the best form of the process. The author concludes from his measurements that the treatment of sodium chloride solution with solid ammonium bicarbonate is to be preferred.

AN account of milk investigations at Garforth is given by Dr. C. Crowther in the *Transactions* of the Highland and Agricultural Society of Scotland for 1904. It is found that change from a highly nitrogenous diet to one relatively poor in nitrogen causes secretion of a larger quantity of milk, but the milk is poorer in fat, the change in the fat-content being much more pronounced in the morning than in the evening milk. During the summer months of 1901, 1902, and 1903, the average percentage of fat in the morning milk of the Garforth herd was found on most days to fall below the standard of 3 per cent. embodied in the regulations for the sale of milk at present in force.